

EAST MERCED RCD

2008 WMA Base Funding/Mini Research Work Plan

Member of Northern San Joaquin Valley WMA

Lower Stanislaus River Invasive Species Control/Fertilization to Reduce Rangeland Weeds

January 1, 2009 – December 31, 2009

Counties covered in this Proposal: San Joaquin, Merced

Contract Lead Group (County, RCD, or Other) and contact information:

East Merced Resource Conservation District, Karen Whipp, (209) 723-6755 ext 10, 2135 Wardrobe Ave, Suite C,
Merced, CA 95341 paddedcell@sbcglobal.net

Primary WMA Lead Person(s) (name, phone number, and address):

Mr. Gary Stockel, WMA Chair, (209) 953-6000, 2101 East Earhart Ave., Suite 100, Stockton, CA 95206)

Project Lead(s) (name, phone number, and address):

Project 1: (Baseline)

Ms. Joanne Karlton, (209) 826-1197, 31426 Gonzaga Road, Gustine, CA 95322-9737

Mr. Tim Keldsen, (209) 826-3508, 947 W Pacheco Blvd Suite C, Los Banos, 93635

Mr. Jason Faridi, (209) 881-3517, 17968 Covered Bridge Road, Oakdale, CA 95361

Project 2: (Research)

Project Lead: Theresa Becchetti, 209-525-6800, tabecchetti@ucdavis.edu, 3800 Cornucopia Way, Ste A, Modesto,
CA 95358

WMA Group Affiliation: Northern San Joaquin Valley WMA (A Three County WMA Group)

All projects described in this work plan will be in one contract: 1 contract with East Merced Resource Conservation District.

Proposed Projects

Project 1 Title: Lower Stanislaus River Invasive Species Control on State, Federal and Private Lands

Project Goal:

This project is the continuation of the work begun with the Grant from CDFA in 2007. The goal of the project is to eradicate or control multiple invasive weeds on State, Federal and Private lands along a ten mile stretch of the lower Stanislaus River from the City of Ripon to its confluence with the San Joaquin River. Invasive species that will be targeted include the following Cal-IPC High- and Moderate- rated weeds: Tree of Heaven (*Ailanthus altissima*), Arundo (*Arundo donax*), Edible Fig (*Ficus carica*), Himalayan Blackberry (*Rubus armeniacus*), Perennial Pepperweed (*Lepidium latifolium*), and Yellow Starthistle (*Centaurea solstitialis*). Northern San Joaquin Valley Weed Management Area members will work together to eradicate these invasive weeds. Project participants include: Caswell Memorial State Park (Caswell), San Joaquin River

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National Wildlife Refuge (Refuge), Army Corp of Engineers (COE) Stanislaus River Parks (SRP) and Faith Ranch (private property managed by Bob & Marie Gallo Foundation). The treated areas will be revegetated with locally native species.

Project Objectives and Methods – list milestones and performance measures:

Objective: Visual surveys for targeted invasive weed species will be conducted in Refuge, COE, Park, and a private land parcels. These surveys will direct eradication efforts. Caswell seasonal staff, trained and overseen by the State Park Environmental Scientist, will continue their ongoing eradication efforts. In previous years, large populations of Himalayan blackberry, arundo, tree of heaven, and edible fig were surveyed and eradicated. Unfortunately, the staff has not treated all the populations and some regeneration is still occurring. With additional funding, the staff should be able to remove all of these invasive species from the Park. A Geographic Information System (GIS) map will be generated combining new and old GPS locations allowing staff to monitor and eradicate invasions more efficiently. On the Refuge, COE, and the Faith Ranch properties, perennial pepperweed and yellow starthistle are the primary species to be controlled. Appropriate herbicide applications will be made by Refuge staff, private landowner, and /or by contract with a licensed pest control business.

Task 1 The State Park Environmental Scientist, the Refuge Biologist/Manager, and the COE Natural Resource Manager will continue to supervise staff and work through December 2009

Task 2: The Caswell staff will treat and/or remove all known infestations and new detections of invasive species within the parks boundary. A backpack sprayer will be used for the basal bark application of herbicide to trees and for treating the re-sprouts of all invasive species. The treated areas will be replanted with native plant species collected from within Caswell.

Task 3: Yellow starthistle, perennial pepperweed and other invasive weeds will be controlled on Refuge lands by appropriate herbicide applications. A professional herbicide contractor, and/or Refuge personnel will carry out the applications.

Task 4: SRP staff will remove and / or have treated by professional herbicide applicators, invasive species in the Mohler Road and Rivers End Recreation Areas.

Task 5: During the spring, Faith Ranch employees will treat yellow starthistle and perennial pepperweed on property controlled by the Bob & Marie Gallo Foundation. During the summer and fall, Faith Ranch employees will treat invasive woody species: common fig and tree-of-heaven.

Task 6: GIS maps will be created, with the locations of detected invasive plants/populations and treatment sites indicated. The maps will have associated metadata describing the original size of the population, along with the method of eradication and date of the treatment.

Performance measures: The collaborators will annually monitor their properties for invasive non-native weed species. Invasive weed populations will be mapped. These maps can be used to determine population reduction and locations of new invasions. We will follow CDFA's weed monitoring protocol, measuring the cover of weeds or counting individual plants when feasible in each treatment site. Also, photo points will be established throughout all project areas and monitored each year.

Project 2 Title: Fertilization to Reduce Rangeland Weeds

Project Goal:

Infestations of *Centaurea solstitialis* (yellow starthistle, YST) and *Taeniatherum caput-medusae* L. (Medusahead, Mh) occur throughout the State, challenging land managers to manage these noxious weeds. Large infestations can be controlled easily through herbicide application or controlled burns. However, low to moderate infestation levels, around 35% or less, create another challenge. In these situations, the cost of chemical treatment is prohibitive. However, such low levels of infestation can repopulate the seedbank and lead to more serious problems in subsequent years. Consequently, growers require an option that provides economical return on their investment, yet gives suppression of YST and Mh.

The timely application of fertilizers when desirable plants, particularly annual grasses, are establishing, but prior to the development of YST and Mh, may have the effect of increasing high quality forage and suppressing YST and Mh. We hypothesize that providing nutrients typically limited in the environment, such as nitrogen, will allow the grasses to out-compete the later germinating and establishing YST and Mh. Preliminary data in Colusa County has been encouraging, with good germination of grasses along the established transects to date leading us to believe that this approach has merit.

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Controlling YST and Mh at low to moderate infestation levels can prevent the more management intensive controls such as large scale herbicide applications or controlled burns, thus also having water quality benefits. This rangeland fertilization project provides a different strategy for land managers to consider, and therefore the site will become on-farm demonstrations. Results will also be disseminated through UCCE channels, local Extension meetings and field days, newsletters, popular press as well as peer reviewed publications. It should be noted that both the Northern San Joaquin WMA and the Colusa, Glenn, and Tehama WMA are submitting applications for the same project. The intent is duplicate the project in two different locations in the State to allow for variance found in the Sacramento and San Joaquin Valleys and therefore strengthens the validity of the recommendation of using fertilizer to control invasive weeds.

What are the project's long-term benefits and/or local, regional or statewide significance (8 sentence Max):

Providing ranchers with a viable option to control invasive weeds before infestation levels require more extensive inputs that are not practical is crucial for rangeland health. With rising costs of inputs, herbicide application is not always economically viable. Cost of fertilizer has also increased, however the benefit can be realized from the increased desirable forage production resulting in increased pounds weaned. This incentive may be all that is needed to encourage ranchers to eradicate YST and Mh before the weeds establish a dominant foot hold on California rangelands.

Priority Topic Area Being Addressed (from request for proposal announcement, 8 sentence Max):

This project targets the little or no management research conducted to date priority area. Research on the use of fertilizer on rangelands for added forage production and weight gains has been extensively conducted. It is known that nitrogen fertilization provides added fall growth. However, the possible benefit of influencing species composition toward desirable species on annual rangelands is a very new concept. The multitudes of range reports and published material on rangeland fertilization have no mention of soil nutrition's effect on rangeland species composition. This new work would test whether the added spring or fall growth helped desirable annual plants and native perennials to out-compete populations of Mh and YST, rather than simply determining if more forage or weight gain was produced.

Please Describe your in-kind contributions toward research project(s) (4 sentence max):

Our cooperators are allowing us to utilize part of their operations, forgoing grazing for the duration of the project, and therefore taking a loss on potential profits. To calculate this cost, the going rental rate for rangelands in the area is used. In addition, partial salaries from the local UCCE advisor, and Field Assistant are also used as in-kind contributions.

Project Objectives, Tasks and Methods:

OVERALL OBJECTIVE (4 sentence Max):

Objectives will be to determine if fertilizing rangelands with low to moderate levels of YST and/or Mh can be effective in controlling these invasive weeds and economically viable for ranchers. The hope is that such a practice can increase forage, yet reduce or possibly eliminate YST and Mh in these situations.

Task 1 (2 sentence Max):

Fertilize plots with nitrogen-based fertilizer in the fall of the year in a location with YST and Mh with no more than 35% infestation levels.

Methods (8 sentence Max)-

A site will be selected with a low to moderate level of YST and/or Mh infestation, 35% or less. The site will be fenced off from livestock grazing during the project. Plots will be established in a randomized complete block for each treatment (3-4 replications per treatment). Treatments will include application of nitrogen based fertilizer (27-0-0) at low and medium rates, and a control of no fertilizer. Sites will be evaluated prior to fertilizer application (November) to document plant species composition and cover, again at mid-season (roughly March), and also at the end of the season (June).

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Performance Measures:

How will you assess and/or analyze your results (8 sentence Max)?

Detailed plant species composition, percent bare ground, plant height, and forage production in pounds per acre will be analyzed for significant differences between the treatments and control. Thus, if YST and Mh levels are decreased, it will be possible to know what took their place. Project design will use a randomized complete block to account for differences in terrain and allow for repetition of treatments. Conclusions of success will only be drawn if statistically significant differences are seen between the treatment and controls. Once the levels of success are statistically proven, economic analysis can determine if the outcome is an economically viable option for weed control.

How will your results be disseminated (4 sentence Max)?

First, the project site will become an on-farm demonstration. In addition, results will also be disseminated through UCCE channels, local Extension meetings and field days, newsletters, popular press as well as peer reviewed publications. UCCE has a long standing tradition of extending research and making available new management practices for rangeland owners to implement.